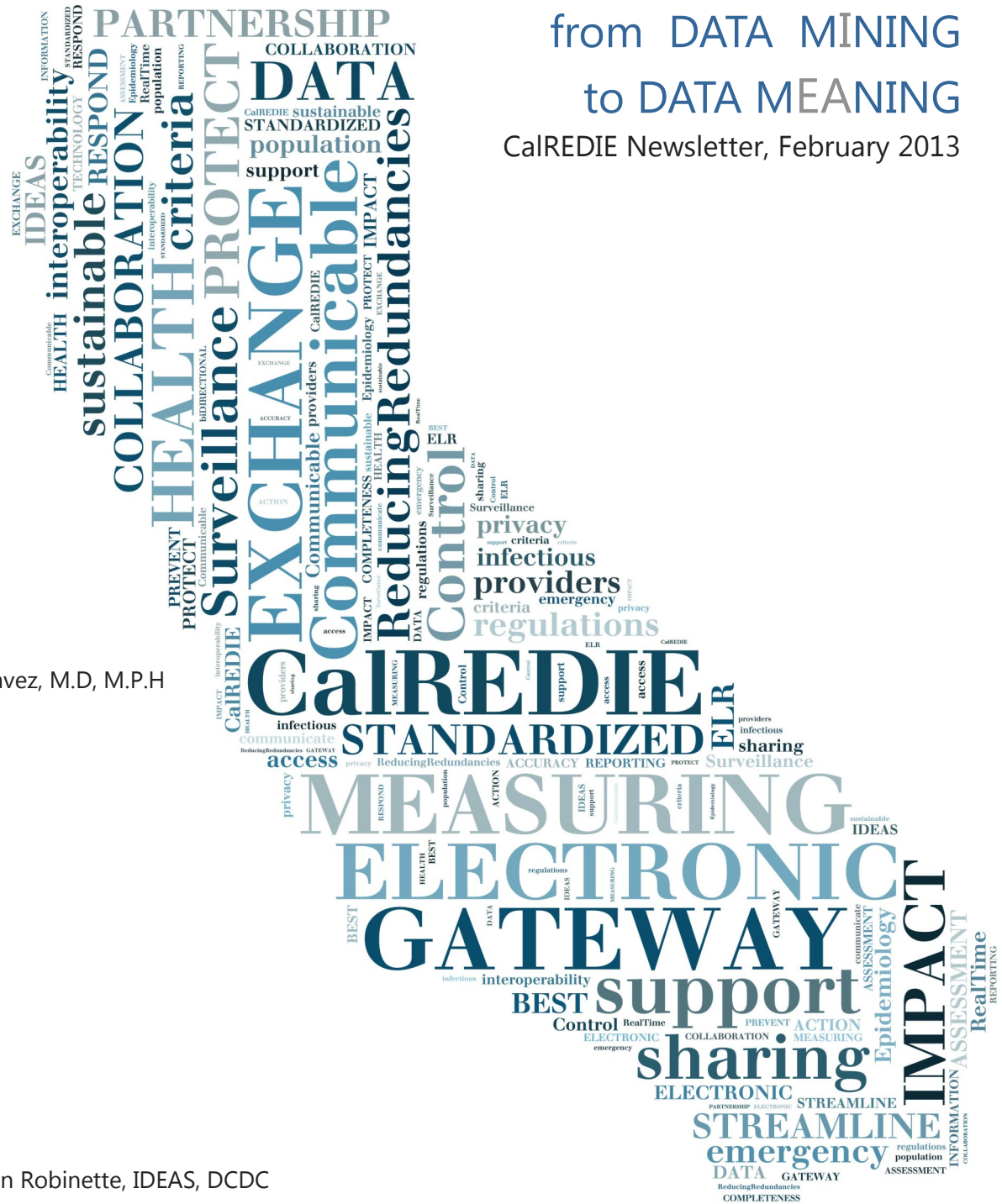
from DATA MINING to DATA MEANING

CalREDIE Newsletter, February 2013



FOREWORD FROM THE STATE EPIDEMIOLOGIST

Gil Chavez, MD, MPH, California State Epidemiologist

I am pleased to share with you that CalREDIE continues to make great strides in its evolution toward being the most comprehensive, user-friendly, and timely infectious disease reporting system in the nation. The development of CalREDIE has been particularly dramatic over the past six months. The CalREDIE v10 upgrade provided system users a great deal of long awaited improvement and much-needed functionality. I understand that CalREDIE users are particularly pleased with the increased application speed and new features. Alerting via ARNOLD has provided crucial real-time notice of user-selected diseases. Personally, I am an avid user of ARNOLD and find it very useful in gauging disease reporting activity. You will be pleased to know that the Electronic Laboratory Reporting (ELR) pilot project is near completion and full integration into CalREDIE is forthcoming. Lastly, more and more local health jurisdictions are adding their health care providers as users of the CalREDIE Provider Portal achieving significant local health jurisdiction staff time savings, increased efficiency, and more importantly, exceptional data timeliness.

The birth and evolution of CalREDIE could not have happened at a more critical time in the public health arena. With the advent of the Affordable Care Act (ACA), the role of epidemiology in measuring impact, service gaps, and population health is most critical. I look forward to working with you to find ways in which CalREDIE will be an essential tool in the public health arsenal to ensure that the ACA is maximized to prevent and control infectious diseases. As more of us work towards public health accreditation of our respective agencies, CalREDIE will play a very important role in documenting our ability to carry out population health assessments, investigate health problems, engage the community, and provide evidence-based information for policy development.

I look forward to our continued progress, system stability, and working with both CalREDIE jurisdictions and those jurisdictions using a system other than CalREDIE for seamless integration of statewide data.

CalREDIE rollout

2012 was a dynamic year as we collaborated closely with the remaining jurisdictions that were not using CalREDIE as their system of record. Today 53 **BLUE** jurisdictions are using CalREDIE for all communicable disease reporting. The **ORANGE** jurisdictions are already using CalREDIE or are in the process of implementing the system for selected diseases (TB and/or STD). We have also initiated strategic discussions to establish standardized and sustainable data exchange processes to allow several programs within LHJs to continue to use their locally developed systems. In the next couple of months we will be forming a Data Exchange Jurisdiction (DEJ) workgroup to continue discussions around data exchange processes and handling of the Electronic Lab Reports (ELR) for jurisdictions that are not using CalREDIE for all communicable diseases.

DCDC criteria for surveillance in 2013

Our current level of statewide coverage under a unified information system greatly exceeds our original expectations. For CalREDIE jurisdictions, we have truly achieved an integrated surveillance system where LHJs can collaborate on cross-jurisdictional issues as they arise, maintaining the integrity and reliability of the original information. This system also allows local and state public health staff to collaborate in real-time during rapidly developing investigations.

Now that the majority of LHJs are using CalREDIE, the goals for reporting and surveillance activities in 2013 are to achieve:

- Increase in Electronic Data inputs -We want a system that does not involve paper
- Compliance with reporting requirements - Complete, accurate and timely data: We want to make sure that we fully meet CDC reporting requirements for nationally notifiable conditions
- Cross-jurisdictional standardization - We need standard data definitions from all Data Exchange Jurisdictions (DEJs) for statewide consistency and reporting to CDC
- Choice of a Sustainable Route - We can reasonably sustain one format for data transmission from jurisdictions using systems outside of CalREDIE. We will be working with DEJs to refine and publish the format.

Over the next 30 days we will be scheduling a strategic meeting with Local Health Jurisdictions to discuss our ongoing collaboration to improve the reporting and surveillance activities and data exchange processes.

Version 10 Implementation

The CalREDIE Team implemented the much-anticipated Version 10 (v10) on Tuesday, December 18, 2012! In addition to a cleaner graphical user interface (GUI) and improved navigation features, v10 offers users several important improvements in functionality. Some of these new features include:

- Changes to how Race is captured, to be more consistent with the paper CMR;
- Save button on every tab within a record, making saving data more convenient;
- Advanced Find feature to allow users to search for records based on a value in a user-defined field (UDF);

Additionally, the implementation of v10 provides the platform for several key initiatives in 2013, including the production roll-out of Electronic Laboratory Reporting (ELR) and the implementation of the CDPH Data Warehouse and Data Distribution Portal (DDP). The DDP allows LHJs to access their data in more "consumable" format. (*Refer to page 9 for more detail*).

We distributed a short post-upgrade survey to users regarding their level of preparation for the transition and their initial impressions of v10. Of 95 respondents all of whom are frequent users of CalREDIE **95% said v10 was an improvement.** The top 3 new features of v10 that users liked were:

- My Case Load
- Increased application speed
- Save on each tab

Expansion of CalREDIE for Pesticide Illness & HIV/AIDS

Concurrent with Version 10, through a multi-organizational agreement, CDPH collaborated with the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA) and the Department of Pesticide Regulation (DPR) to implement CalREDIE for Pesticide Illness Reports (PIR). The CalREDIE Team is working with Office of AIDS (OA) to get their Adult Case Report Form (ACRF) implemented into CalREDIE, and we are on track to implement HIV reporting via CalREDIE this spring.

HIV/AIDS Reporting

Steven Starr, Chief, HIV/AIDS Surveillance Section

Partnership between CalREDIE and Office of AIDS (OA) teams: *For over a year, the OA Surveillance, Research, and Evaluation Branch has been working closely with the CDPH CalREDIE team in an effort to use CalREDIE to process HIV and AIDS data along with other reportable diseases. We are currently developing an electronic Adult HIV/AIDS Case Report Form (ACRF) that HIV/AIDS Surveillance Coordinators will be able to access via CalREDIE. There are a number of reasons why this electronic ACRF has been created. First, it will save the Local Health Jurisdictions (LHJs) money and time by eliminating the secure mailing of ACRFs to OA. Second, the HIV/AIDS Surveillance data will be securely transferred through the CalREDIE system directly into the Centers for Disease Control and Prevention (CDC) Enhanced HIV/AIDS Reporting System (eHARS), eliminating possible security breaches from lost mail. Third, since the data is being entered directly, we will be minimizing the chance of data entry issues and it will improve the overall timeliness of the surveillance system. Please know that when we have a first draft ready, I will be sharing it with a number of LHJs for their input.*

Implementation: *As currently reflected in the project plan, we will begin implementation of the new form in April 2013, with three pilot jurisdictions that have yet to be determined. When the pilot jurisdictions are on line, and we are comfortable with our data process and the quality of data going into eHARS, we will continue the rollout to 3 -5 additional jurisdictions at a time until all CalREDIE jurisdictions are connected. As of this publication San Francisco, Los Angeles, Ventura, San Diego and Alameda will NOT be using CalREDIE for HIV/AIDS Surveillance. As we get closer to the pilot we will share the overall schedule with everyone.*

The implementation of the CalREDIE electronic ACRF impacts the OA HIV/AIDS Surveillance office and the LHJ HIV/AIDS Surveillance Coordinators. More information will be shared as it is available. We will be engaging LHJ HIV/AIDS Surveillance Coordinators across the state to review the process and procedures so they can weigh in during the planning.

HIV/AIDS Electronic Lab Reporting (ELR): *In the near future, we hope to start including HIV/AIDS laboratory reports in the overall implementation of ELR through CalREDIE. Collectively, state and local health staff process about 150,000 HIV-related lab reports across the state every year, which means this change, will significantly impact all of us who work in HIV surveillance.*

We are still working on developing an ELR process that meets the needs of LHJs and the OA and is consistent with the laws and regulations surrounding HIV/AIDS laboratory reporting in California. We heard clearly from LHJ HIV/AIDS Surveillance Coordinators that having access to all your labs is essential and that will be a key aspect of the final process flow. The good news for all of us is that when ELR is up and running, LHJ HIV Surveillance staff (except for those mentioned above who are not participating in CalREDIE) and OA Surveillance staff will not have to manually enter HIV/AIDS related lab reports into the Lab Data Entry Tool (LDET) or eHARS, saving a significant amount of time and energy. We are targeting July 2013 for the first HIV/AIDS ELR pilot. Throughout this process, rest assured that every single lab report for patients in your jurisdiction will be available and accessible.

We will share more information as we approach the launch date. If you have any questions or concerns, please feel free to contact me at steven.starr@cdph.ca.gov or 916.449.5954.

Pesticide Illness Reporting (PIR)

Joy A. Wisniewski, Ph.D. Staff Toxicologist
Office of Environmental Health Hazard Assessment

With the release of CalREDIE v10 in December 2012, Pesticide Illness Reporting (PIR) functions are available to local and state CalREDIE users. The California Department of Public Health (CDPH) partnered with the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA) and the Department of Pesticide Regulation (DPR) on this important public health project. This is the first non-communicable illness to be added to CalREDIE, and the first CalREDIE collaboration with an outside agency.
The ultimate goal of "CalREDIE/PIR" is timely, accurate, and complete reporting of pesticide illnesses by health care providers. This will facilitate rapid responses by local and state investigators, which may reduce the occurrence of future illnesses.

This month we kicked off the CalREDIE/PIR training sessions via webinar. We are offering two sets of webinars – the first two webinars for current CalREDIE users and the last two webinars for new users, who might use CalREDIE only for pesticide illness reporting. The webinars will be recorded for future reference and for those unable to attend the scheduled sessions. After local users go live with CalREDIE/PIR, we will make the Provider Portal available to health care providers to report pesticide illness. We will also need local jurisdiction assistance to reach out and recruit providers.

We anticipate that the switch from paper-based to electronic pesticide illness reporting will not cause any major changes to local workflow, except to make the process simpler and faster. Cases submitted by providers will appear in the Disease Incident Staging Area (DISA) until they are accepted into CalREDIE by the local health jurisdiction staff. When staff triggers an import into CalREDIE, OEHHA and DPR can receive notification of pesticide illness incidents via ARNOLD. Local health jurisdictions (LHJ) will no longer need to fax or mail those reports to the state. One exception is for work-related pesticide illness or injury cases, in which the Department of Industrial Relations must be notified by the local health jurisdiction.

A local health jurisdiction's agricultural and environmental health personnel responsible for pesticide illness reporting (without other local health jurisdiction responsibilities) will be able to access CalREDIE/PIR in a role limited to their duties. These users will be authorized to access the PIR functionalities where they can enter fax or phone cases into CalREDIE.

For more information, please contact Joy Wisniewski, Office of Environmental Health Hazard Assessment (Joy.Wisniewski@oehha.ca.gov) or the CalREDIE Help Desk.

Provider Portal

One of the department's priorities for 2013 is the continued expansion of the Provider Portal, which allows health care providers to submit their confidential morbidity reports directly to CalREDIE, for real-time receipt and processing by the LHJs. Currently, there are about 1000 providers from 19 LHJs reporting into CalREDIE. We have an additional 5 jurisdictions going through the PP implementation process now. This year, we aim to have every LHJ using CalREDIE with at least 1 provider reporting via CalREDIE. In addition to the increase in timeliness of reporting, implementation of the PP reduces the burden of data entry at the local level since the providers are entering the data themselves.

If you are interested in starting to utilize the Provider Portal functionality in 2013 please contact the CalREDIE Help Desk.

DISA Trainings, Spring 2013

This spring we will be offering several training sessions on how to use the Disease Incident Staging Area (DISA), the triage area where all reports that come in electronically via ELR or the PP appear. It will be up to each LHJ to review the reports in the DISA and then import them into the CalREDIE Master Person Index. LHJ users are only able to see reports that belong to their jurisdiction and have a variety of options for how to import the report. As we move to widespread electronic reporting, the DISA will be an important area of CalREDIE that local users will use regularly.

ARNOLD

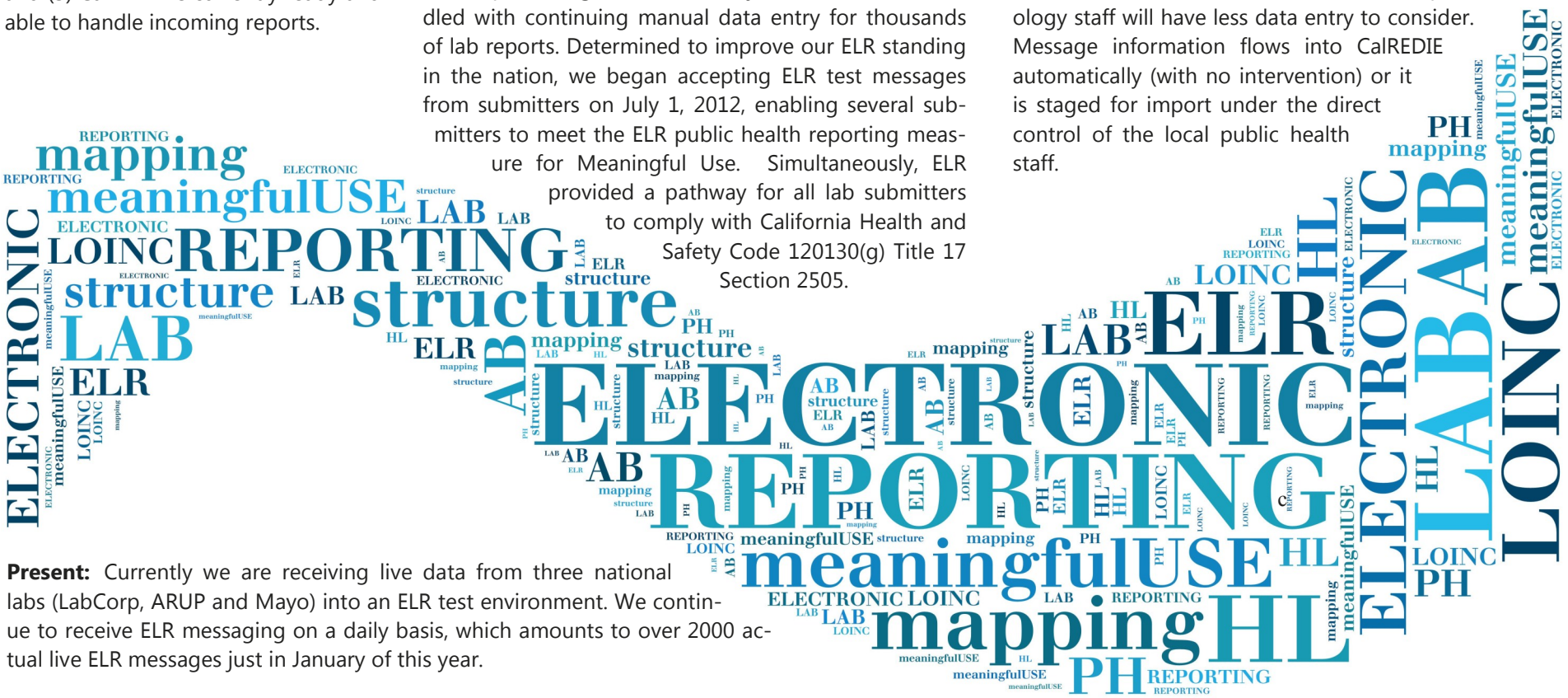
ARNOLD is the alerting and notification module available to all state and local CalREDIE users. With this module, users can sign up to receive email alerts when certain events happen within CalREDIE. Users select the criteria on which they want to be notified, and when those conditions are met in the system, CalREDIE will send an email notification with a link to the specified incident. For example, a user could choose to receive an alert any time an incident of Influenza is submitted via the PP or anytime a new incident of Anthrax is entered.

If you have not signed up for the ARNOLD notifications already and need some assistance, please contact the CalREDIE Help Desk.

Past: Starting a little over three years ago and building up to a "perfect storm" are three factors helping us get ELR moving—(1) Health and Safety Code 120130(g) as modified by AB 2658 (2008) requires electronic reporting of lab results suggestive of disease, (2) Meaningful use incentives for electronic lab reporting to public health, and (3) CalREDIE is currently ready and able to handle incoming reports.

Over one year ago, CalREDIE was in its infancy regarding ELR messaging. We had just released the ELR transmission standard as the CalREDIE ELR2PH Companion Guide. The secure transport mechanism (SFT) and the intake integration engine (Rhapsody) were put in place but they were unproven and unrefined. Potential ELR submitters seeking to participate in the public health reporting measures of Meaningful Use were granted exclusions due to the inability for public health agencies to accept messages. Local health jurisdictions were saddled with continuing manual data entry for thousands of lab reports. Determined to improve our ELR standing in the nation, we began accepting ELR test messages from submitters on July 1, 2012, enabling several submitters to meet the ELR public health reporting measure for Meaningful Use. Simultaneously, ELR provided a pathway for all lab submitters to comply with California Health and Safety Code 120130(g) Title 17 Section 2505.

Future: Fax machines are going the way of the dinosaur. For sure, there may be occasional, but diminishing, need for faxes. The bulk of lab reports must go through ELR in order to comply with reporting regulations. Meaningful Use Exclusions for lack of public health capacity will no longer suffice. With Section 2505 lab reporting requirements supported by the rules and incentives of Meaningful Use Stage 2, we will continue recruiting and engaging ELR submitters across the state. Local Health Jurisdiction epidemiology staff will have less data entry to consider. Message information flows into CalREDIE automatically (with no intervention) or it is staged for import under the direct control of the local public health staff.

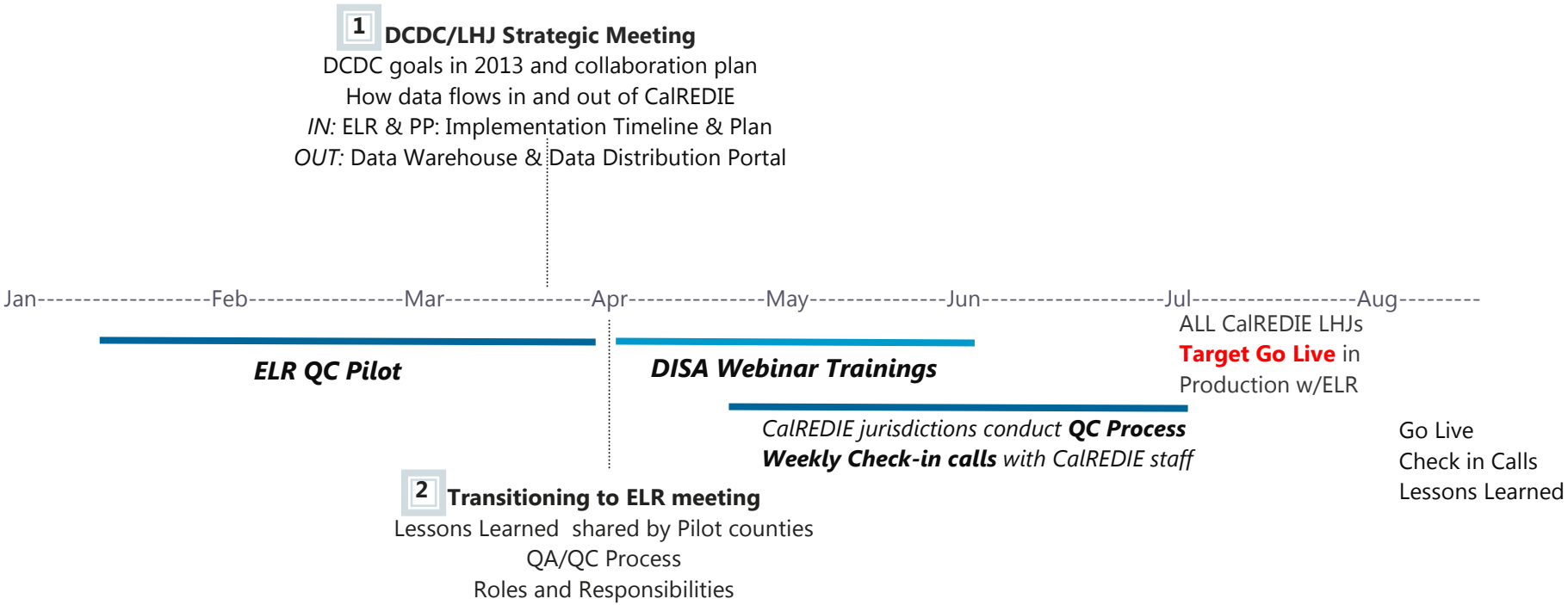


Present: Currently we are receiving live data from three national labs (LabCorp, ARUP and Mayo) into an ELR test environment. We continue to receive ELR messaging on a daily basis, which amounts to over 2000 actual live ELR messages just in January of this year.

Over 60 hospitals are enrolled and engaged at various points in their ELR message testing progression. We still have capacity to enroll additional submitters due to the fact that we have automated responses to enrolling and testing. In order to stop sending "traditional" reports (mostly fax or even mail), any submitter will have to pass the Quality Control analysis of their ELR feed to ensure that it is a sufficient replacement reporting mechanism.

Transitioning to ELR – Strategic and support meetings with LHDs

In the next few months, the CalREDIE Team will engage in a series of discussions to prepare local health jurisdiction stakeholders to handle Electronic Lab Reports (ELR) on a production basis.



DCDC /LHJ strategic meeting: At the Strategic meeting with Health Officers and local health jurisdiction representatives in March, we will discuss the overall conceptual data flow into and out of CalREDIE. As an important piece of the data input to CalREDIE, we will present the roadmap for transition to ELR.

Transition to ELR, meeting: In the weeks following the strategic meeting, the ELR pilot jurisdictions will share lessons learned from their *ELR QC process.* We will also discuss the ELR handling activities that local health jurisdictions may choose to perform as a part of their QC process.

During the course of three months, April through the end of June, as a part of our transitioning support, the CalREDIE Team will host **DISA trainings** *(refer to page 5 for more information)* and weekly check-in calls to prepare locals for ELR handling in CalREDIE.

What is the ELR QC process

Local health jurisdictions may choose to follow the ELR QC process in order to gain a sense of the reliability of ELR from a given lab submitter. ELR will replace faxing and it enables the submitter to comply with state public health lab reporting regulations.

There is a certain sense of trust which is placed in the fax. Going through the ELR QC process can help a local health jurisdiction build the sense of trust in ELR as a replacement for the fax. Note that some findings require the lab to contact the LHO by phone. ELR does NOT replace that requirement.

Often, fax will not exactly match ELR in terms of number of reports. According to experiences in other states and other communities, ELR frequently exceeds fax in terms of volume of reports and it definitely exceeds fax in terms of speed of transmission and accuracy of automated data transcription.

With a national ELR submitter who is very experienced in transmitting ELR to public health, the ELR QC process can be streamlined to a minimal period of analysis and comparison, which is convenient for the receiving jurisdiction.

The CalREDIE team performs the technical analysis on the ELR stream—checking for proper data flow and raising technical issues with the submitter.

The receiving local health jurisdiction may raise content issues to the CalREDIE ELR Team, who will determine whether the issue is a CalREDIE technical issue, a submitter issue, or a policy issue. For submitter issues, the submitting lab may perform investigation and reporting on the issue. CalREDIE issues are handled by the CalREDIE ELR Team and policy issues are considered by the CalREDIE Executive Committee (CEC).

It is suggested that local health jurisdictions go through this process for at least a few weeks and not more than 90 days. During the ELR QC process, the LHJ should consider the significant temporary burden of dual data entry.

The successful exit from the ELR QC process marks the transition to production status for the ELR Submitter. Achievement of production status will be documented with a formal notice to the submitter that they can stop fax/paper reporting and rely on ELR as the primary means of reporting lab results to public health.

What does it cost to join CalREDIE ELR?

There is no direct financial cost to participate in CalREDIE ELR. In fact, engaging in ELR represents a potential organizational effort reduction - less faxing or mailing, less manual compilation of data, and less manual reporting to public health agencies. There is a one-time effort to set up an interface and achieve compliant messaging, plus the effort it takes to maintain the submitter reporting system interfaces.

What does ELR mean for the local health jurisdiction?

LHJ staff may need to adjust current business processes in order to adapt to differences in the way that information is received from the labs. Going forward, the burden of data entry from faxed lab reports should diminish greatly. The workload is shifting from the fax machine and lab data entry to the CalREDIE Disease Incident Staging Area (DISA), where LHJ staff will handle incoming lab reports.

What about the local public health lab?

The local public health lab performs testing and often obtains results reportable to public health agencies. The local public health lab will become a CalREDIE ELR submitter.

CDPH Gateway Concept

James Watt, M.D., M.P.H.
Chief of the Division of Communicable Disease Control (DCDC)

Data is an essential raw material for surveillance, epidemiologic analysis and effective policy development. Improving data timeliness, accuracy and completeness is essential to improve public health efforts in focused and measurable ways.

Historically, we have been sustaining multiple data inputs and multiple different data formats from various siloed systems that could not talk to each other. Data elements and definitions were not standardized, there was duplicate data entry and lots of paper that we often did not have resources to sort through and analyze. We are moving toward a whole new paradigm where we are building integrated systems to reduce redundancy, improve quality and enable interoperability. These systems are web-based and are enabling electronic information exchange which allows us to receive data in a much more timely fashion. We are standardizing our data so that we know that information coming from different sources is comparable.

The CDPH gateway vision is a major step forward. The gateway will enable us to leverage technologies that are being deployed across different data systems that have been operating in siloed ways. By implementing standard data formats across all of our various data streams we will be able to interact with different submitters of information independent of the kind of data that they are sending. We are looking towards a future where there is a tremendous opportunity for interoperability between immunization data, vital records, communicable disease reports, cancer case reports , etc. This platform also creates enhanced opportunities for our customers to access data in the common streamlined way with appropriate rights and data access rules.

The technology that we are using is enabling for much more robust bidirectional information exchange, so that we don't have just data coming in from LHJs to state and going off to CDC but it is actually enabling us to put up a Data Distribution Portal so that LHJs can access data that they need.

CalREDIE Data Warehouse (DW)

The CalREDIE Data Warehouse (DW) is the platform for a single data repository for communicable disease data enabling us to achieve the intended goal of a single state-wide surveillance data store. Concurrent with the implementation of CalREDIE Version 10, CDPH has implemented the DW in the production environment. One of our main priorities for this year is to streamline data transfer from jurisdictions that have not implemented CalREDIE as the sole method of disease reporting to the state. This will create a single data repository combining data from all jurisdictions. In addition to the improved reporting and performance capabilities for state and local users, the accuracy of CDC reporting will be improved because all surveillance data is located in a single, centralized repository.

Data Distribution Portal (DDP)

The DDP is a web-based user interface for the new CDPH DW with enhanced reporting and performance capabilities over those within the core CalREDIE application. All CalREDIE state and local users will be able to access the DDP.

DDP Pilot

The "LHJ Production Pilot of the DDP" includes Santa Barbara, San Joaquin, Placer, and Orange counties. It is the last major step before CDPH commits to launching the DDP application for use state-wide. This is CDPH's first opportunity to test the technical capabilities of the system and experience how it operates with our production infrastructure, alongside other programs and systems, and provides opportunities for CDPH technical staff to gain practical experience with the DDP. Through this real life operational implementation, CDPH can assess our agency's ability to utilize the system effectively and gauge whether the proposed solution meets the needs of our LHJ partners.
Goals:

- Reduce the technical risks involved in a state-wide deployment
- Acquire information for a larger rollout
- Acquire information on how to enhance the DDP
- Gain acceptance by LHJ

The pilot began on January, 9 2013 and will continue to the end of February 2013. At the conclusion of the pilot, CDPH and the pilot users will determine whether or not to move forward with a state-wide rollout in March 2013.

Continuous Quality Improvement: A way of life at CDPH

After the implementation of the CalREDIE system, responsibility for compiling data from all 61 local health jurisdictions transferred from the Infectious Disease Branch (IDB) to the Communicable Disease Emergency Response branch (CDER). Data for reportable diseases comes in from multiple sources (CalREDIE, legacy systems, and data sets transmitted from jurisdictions not using CalREDIE) and must be compiled into various products for internal (e.g. other programs in DCDC) and external (e.g. CDC) customers.

1_PLAN

Select improvement opportunity: The three main objectives of our initiative were to: 1) ensure availability of high quality and complete data sets for both internal and external customers, 2) improve the efficiency of the reportable disease data transfer process, and 3) implement systems for quick action to respond to public health emergencies.

Analyze current situation: We began by reviewing all incoming data sources, data products generated and the methods used to compile and create data sets. We learned several useful tools to facilitate the above process including brainstorming, flow charts and tree diagrams.

Identify root causes: Our team consisted of representatives from DCDC, CalREDIE, CDER and IDB. The team benefitted by having individuals with different backgrounds, knowledge bases, areas of expertise and perspectives on the issue who worked together to identify and gather facts and opinions on the areas for improvement. From productive brainstorming sessions, preparation of an in-depth force field analysis and drafting a fishbone diagram, we learned and applied valuable tools for successful collaboration.

Generate and choose solutions: All of the above efforts helped us to develop an effective and reasonable solution by guiding our action plan and specifying targets for improvement. We prioritized our approach to best use our resources, and team members were assigned specific tasks to guide our plan for change. We identified specific targets for improvement and ways of measuring our progress.

2_DO

Map out and implement a trial run: We have been documenting and tracking the barriers to compilation and submission of data to CDC on a weekly basis. This has allowed us to identify specific areas for technical enhancements, improvements in data transfer and data accuracy, and processing modifications. Where appropriate, some changes have already been implemented, including the addition of an "early warning" notification system for detection of extremely urgent/urgently notifiable diseases entered into CalREDIE.

3_CHECK

Analyze the results and draw conclusions: During the process of testing and subsequently implementing changes to the process, we continue to track and document results to verify that we are achieving our objectives.

4_ACT

Adopt, adapt or abandon: We continue to move forward with implementing improvements, and one of our overarching achievements is the creation of a Data Warehouse, a repository of complete, high quality data sets that can be made available for use by CDPH programs, local health jurisdictions, as well as used for reporting notifiable diseases to CDC.

Monitor; hold the gains: The principles of Continuous Quality Improvement encourage us to continue to observe the results of the changes implemented and make adjustments to maintain our objective.

Making SURVEILLANCE IDEAS possible with technology

Ron Robinette, Chief, Informatics, Data Exchange, and Applications Section (IDEAS), Center for Infectious Diseases

The Informatics, Data Exchange, and Applications Section (IDEAS) has invested heavily in web services and data services technology and training over the past few years in order to modernize the communicable disease surveillance system in California.

We believe that the data we maintain for our program areas is meaningless until it touches the lives of people and ultimately provides timely, accurate, complete and efficient surveillance data for public health action.

At CDPH in the Center for Infectious Diseases (CID), having a single, unified communicable disease data system has been a dream for some time. However, fulfilling this dream and modernizing our various legacy systems is a challenging and ambitious undertaking. Through the 1980s, 1990s, and 2000s, the AVSS allowed for core surveillance counts to be received in a standard format. This system did not address all communicable disease surveillance needs. Extended case report data were transmitted through a variety of means (BBS, SFTP, Extranet shares, etc.) in a variety of formats from individual health jurisdictions to CDPH, who in turn negotiated submission with providers within their jurisdiction through a variety of means (fax, mail, etc.). These processes significantly limited the timeliness of public health action and the completeness of public health data. While internet based data exchange technologies expanded in the 90s and 2000s there were few vendors in the marketplace offering products to support full public health case management, which would have forced the State to invest in a custom-developed solution which would have increased the cost-to-entry significantly. In 2008, CDPH engaged a vendor to install a web-based system for disease surveillance, CalREDIE. CalREDIE has enabled a standard data model to be developed and utilized for both core and extended data. Installation and maintenance of CalREDIE enables accurate and efficient reporting, but in order to enhance our ability to be timely and accurate, we needed to deploy web services. With funding from CDC, we have obtained our message broker technology, Orion Rhapsody. Rhapsody validates automated data feeds from outside of CDPH and delivers this data to systems residing within CDPH in a secure manner. For CalREDIE, this enables incoming lab data to be processed in near real-time directly from laboratories. This is how we're going to take lab data from 100+ LIMS vendors used by labs throughout the state, CAPTURE it once the lab test is done, PROCESS the information we need, start a disease incident profile in CalREDIE, and NOTIFY the right person in CalREDIE with automated email notification. Upon following a link within the notification and authenticating with the system, the data will be DISPLAYED to the user. We call this magic, "The CDPH Gateway." The CDPH Gateway is also going to allow us to process full disease incident profiles from jurisdictions not exclusively using CalREDIE in a complete and efficient manner. But first, we have to couple our web services solution with the other technology we've invested in, data services.

In December of 2012, shortly after the launch of CalREDIE v10, we also launched the Data Distribution Portal (DDP). Prior to the implementation of the DDP, CalREDIE users' only option for obtaining data and reports was by using the functionality provided in the Atlas vCMR product line. Although the vCMR product line does provide exporting and reporting capabilities, these capabilities are limited in functionality and performance. Initially, the performance of the CalREDIE exports were acceptable; however, as each Local Health Jurisdiction (LHJ) initiated use of CalREDIE the additional data burden impacted export performance negatively. Within three years of the CalREDIE implementation date, LHJs had to use clumsy and time consuming work arounds to export data. The DDP has resolved this issue and LHJs can now run disease-specific exports within 5 seconds and export all conditions within 15 seconds. The primary design flaw of the CalREDIE application, and many applications, is that they are designed to use a transaction-oriented database. Transaction-oriented databases are high-normalized data models that are efficient at collecting and storing data, however their "Achilles Heel" is data distribution (SQL reads). To resolve this issue, the DDP uses a de-normalized data model structure to create a Data Warehouse that is populated with CalREDIE data nightly. This allows for dramatically improved turnaround time for analysis and reporting, sharing data and allowing others to easily access data, supporting ad hoc reporting and removing the informational processing load from transaction-oriented databases. The combination of the DDP application and the Data Warehouse has allowed for CDPH to expand CalREDIE and the DDP to the Department of Pesticide Regulation for Pesticide Illness Reporting and will allow CDPH to accept disease information from Local Health Jurisdictions that are not exclusively using CalREDIE.

We are very proud to have these solutions ready for production use and are looking forward to scaling both web services and data services vertically (increased transaction load) and horizontally (more program areas) across CDPH!

INTERESTED in CalREDIE? CalREDIE Help Desk 866.866.1428 CalRDIEHelp@cdph.ca.gov